- 25 -

What is claimed is:

1   1. A method of communicating between a source and a target node in a clustered
2   computer system, the method comprising:
3   establishing a cluster data port between the source node and a target node,
4   the cluster data port configured to select among a plurality of connection paths
5   between the source node and the target node, and to selectively switch over data
6   flow from the target node to a backup target node; and
7   communicating data from the source node to the target node using the
8   cluster data port.

1   2. The method of claim 1, wherein establishing the cluster data port includes
2   establishing a plurality of logical connections between the source node and the target
3   node, each logical connection configured to communicate data over a connection path
4   among the plurality of connection paths.

1   3. The method of claim 2, wherein establishing the cluster data port includes
2   exchanging between the source and target nodes network addresses associated with at
3   least one of the source and target nodes.

1   4. The method of claim 2, wherein establishing the cluster data port includes
2   registering a client that is resident on the source node with the cluster data port.

1   5. The method of claim 4, wherein registering the client comprises identifying to
2   the data cluster port at least one callback function associated with the client, wherein the
3   cluster data port is configured to notify the client of a data port event by calling the
4   callback function.

1   6. The method of claim 1, wherein communicating data from the source node to

2 the target node includes performing load balancing in the cluster data port to distribute

3 the data among the plurality of connection paths.

1   7. The method of claim 1, wherein each connection path comprises a TCP

2 connection.

1   8. The method of claim 1, wherein the cluster data port is configured to

2 communicate data between the source and target nodes according to a messaging protocol

3 selected from the group consisting of an asynchronous messaging protocol and a

4 synchronous messaging protocol.

1   9. The method of claim 1, further comprising, with the cluster data port,

2 switching data flow from the target node to a backup target node in response to an

3 inability to communicate with the target node.

1   10. The method of claim 9, wherein switching data flow from the target node to

2 the backup target node includes establishing a logical connection between the source

3 node and the backup target node.

1   11. The method of claim 9, further comprising notifying a client of the cluster

2 data port service of the inability to communicate with the target node, wherein switching

3 data flow from the target node to a backup node is performed in response to initiation of a

4 cluster data port failover by the client.

1   12. The method of claim 9, wherein switching data flow from the target node to a

2 backup node is initiated by the cluster data port.

1   13. The method of claim 1, further comprising, with the cluster data port,

2 resetting a logical connection between the source node and the target node in response to

3 an inability to communicate with the target node.

1   14. The method of claim 1, further comprising communicating data from the

2 target node to the source node using the cluster data port.

1   15. The method of claim 1, wherein the target node is remote from the source

2 node, and wherein communicating data from the source node to the target node includes

3 communicating mirror data to support remote mirroring between the source and target

4 nodes.

1   16. An apparatus, comprising:

2   a memory;

3   at least one processor; and

4   program code resident in the memory and configured for execution on the

5   at least one processor to implement a cluster data port for a clustered computer

6   system of the type including a plurality of nodes, the cluster data port configured

7   to support communication between a source node and a target node among the

8   plurality of nodes, the cluster data port further configured to select among a

9   plurality of connection paths between the source node and the target node, and to

10   selectively switch over data flow from the target node to a backup target node.

1   17. The apparatus of claim 16, wherein the cluster data port is configured to

2   establish a plurality of logical connections between the source node and the target node,

3   each logical connection configured to communicate data over a connection path among

4   the plurality of connection paths.

1   18. The apparatus of claim 17, wherein the cluster data port is configured to

2   exchange between the source and target nodes network addresses associated with at least

3   one of the source and target nodes.

1   19. The apparatus of claim 17, wherein the cluster data port is configured to

2   register a client that is resident on the source node.

1   20. The apparatus of claim 19, wherein the cluster data port is configured to

2   receive from the client at least one callback function associated with the client during

3   registration of the client, wherein the cluster data port is configured to notify the client of

4   a data port event by calling the callback function.

1   21. The apparatus of claim 16, wherein the cluster data port is configured to load

2   balance data communicated between the source and target nodes to distribute the data

3   among the plurality of connection paths.

1   22. The apparatus of claim 16, wherein each connection path comprises a TCP

2   connection.

1   23. The apparatus of claim 16, wherein the cluster data port is configured to

2   communicate data between the source and target nodes according to a messaging protocol

3   selected from the group consisting of an asynchronous messaging protocol and a

4   synchronous messaging protocol.

1   24. The apparatus of claim 16, wherein the cluster data port is configured to

2   switch data flow from the target node to a backup target node in response to an inability

3   to communicate with the target node.

1   25. The apparatus of claim 24, wherein the cluster data port is configured to

2   switch data flow from the target node to the backup target node by establishing a logical

3   connection between the source node and the backup target node.

1   26. The apparatus of claim 24, wherein the cluster data port is further configured

2   to notify a client of the cluster data port of the inability to communicate with the target

3   node, and wherein the cluster data port is configured to switch data flow from the target

4   node to a backup node in response to initiation of a cluster data port failover by the client.

1   27. The apparatus of claim 24, wherein the cluster data port is configured to

2   initiate the switch of data flow from the target node to a backup node.

1   28. The apparatus of claim 16, wherein the cluster data port is configured to reset

2   a logical connection between the source node and the target node in response to an

3   inability to communicate with the target node.

1   29. The apparatus of claim 16, wherein the cluster data port is configured to

2   support bidirectional communication between the source and target nodes.

1   30. The apparatus of claim 16, wherein the target node is remote from the source

2   node, and wherein the cluster data port is configured to communicate mirror data from the

3   source node to the target node to support remote mirroring between the source and target

4   nodes.

1   31. A clustered computer system, comprising:

2   a plurality of nodes; and

3   a cluster data port resident on at least one of the plurality of nodes and

4   configured to support communication between a source node and a target node

5   among the plurality of nodes, the cluster data port configured to select among a

6   plurality of connection paths between the source node and the target node, and to

7   selectively switch over data flow from the target node to a backup target node.

1   32. The clustered computer system of claim 31, wherein the cluster data port is

2   configured to select among the plurality of connection paths using a load balancing

3   algorithm.

1   33. The clustered computer system of claim 31, wherein the cluster data port is

2   configured to switch over data flow from the target node to the backup target node in

3   response to an inability of the source node to communicate with the target node.

1   34. The clustered computer system of claim 31, wherein the target node is remote

2   from the source node, and wherein the cluster data port is configured to communicate

3   mirror data from the source node to the target node to support remote mirroring between

4   the source and target nodes.

- 32 -

1   35. A program product, comprising:

2   program code configured to implement a cluster data port for a clustered

3   computer system of the type including a plurality of nodes, the cluster data port

4   configured to support communication between a source node and a target node

5   among the plurality of nodes, the cluster data port further configured to select

6   among a plurality of connection paths between the source node and the target

7   node, and to selectively switch over data flow from the target node to a backup

8   target node; and

9   a signal bearing medium bearing the program code.

1   36. The program product of claim 35, wherein the signal bearing medium

2   includes at least one of a recordable and a transmission medium.